



NM OIL CONSERVATION
ARTESIA DISTRICT

NOV 14 2016

RECEIVED

COG Operating LLC

Eddy County, NM (NAD-83 2015)

Puckett 13 Fed Com 25H

API #: 30-15-43785

SHL: 250' FNL, 1,965' FEL, Sec 13, T-17S, R-31E, Unit B

PP: 330' FNL, 2,289' FEL, Sec 13, T-17S, R-31E, Unit B

BHL: 359' FSL, 2,290' FEL, Sec 13, T-17S, R-31E, Unit O

Design: BHL: 350' FSL, 2,293' FEL, Sec 13, T-17S, R-31E, Unit O

Standard Survey Report

26 August, 2016





TDS
Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Puckett 13 Fed Com 25H
Project:	Eddy County, NM (NAD-83 2015)	TVD Reference:	KB @ 3978.00usft (Silver Oak 3)
Site:	Puckett 13 Fed Com 25H	MD Reference:	KB @ 3978.00usft (Silver Oak 3)
Well:	SHL: 250' FNL, 1,965' FEL, Sec 13,T-17S,R-31E,Unit B	North Reference:	Grid
Wellbore:	BHL: 350' FSL, 2,290' FEL, Sec 13,T-17S,R-31E,Unit O	Survey Calculation Method:	Minimum Curvature
Design:	BHL: 350' FSL, 2,290' FEL, Sec 13,T-17S,R-31E,Unit O	Database:	EDM 5000.1 Single User Db

Project	Eddy County, NM (NAD-83 2015)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Puckett 13 Fed Com 25H, Sec 13, T-17S, R-31E, Unit B		
Site Position:		Northing:	670,160.90 usft
From:	Map	Easting:	698,719.00 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in
		Latitude:	32° 50' 28.494 N
		Longitude:	103° 49' 15.242 W
		Grid Convergence:	0.28 °

Well	SHL: 250' FNL, 1,965' FEL, Sec 13,T-17S,R-31E,Unit B					
Well Position	+N/-S	0.00 usft	Northing:	670,160.90 usft	Latitude:	32° 50' 28.494 N
	+E/-W	0.00 usft	Easting:	698,719.00 usft	Longitude:	103° 49' 15.242 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	3,978.00 usft	Ground Level:	3,960.00 usft

Wellbore	BHL: 350' FSL, 2,290' FEL, Sec 13,T-17S,R-31E,Unit O				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	8/9/2016	7.21	60.60	48,362

Design		BHL: 350' FSL, 2,290' FEL, Sec 13,T-17S,R-31E,Unit O			
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	183.64	

Survey Program		Date 8/26/2016		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.00	2,000.00	VES Gyro #1 (BHL: 350' FSL, 2,290' FEL,	VES-ISCWSA-GYRO-3	Biaxial Semi-Cont. Gyro
2,091.00	10,674.00	TDS MWD #2 (BHL: 350' FSL, 2,290' FEL	MWD	MWD - Standard

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.20	185.49	100.00	-0.17	-0.02	0.17	0.20	0.20	0.00
200.00	0.16	184.74	200.00	-0.49	-0.04	0.49	0.04	-0.04	-0.75
300.00	0.04	163.02	300.00	-0.66	-0.05	0.66	0.12	-0.12	-21.72
400.00	0.24	156.52	400.00	-0.88	0.05	0.88	0.20	0.20	-6.50
500.00	0.34	125.65	500.00	-1.25	0.37	1.22	0.18	0.10	-30.87
600.00	0.14	123.82	600.00	-1.49	0.71	1.44	0.20	-0.20	-1.83



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Site:	Puckett 13 Fed Com 25H	MD Reference:	KB @ 3978.00usft (Silver Oak 3)
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Wellbore:	BHL: 350' FSL, 2,290' FEL, Sec 13,T-17S,R-31E,Unit O	Survey Calculation Method:	Minimum Curvature
Design:	BHL: 350' FSL, 2,290' FEL, Sec 13,T-17S,R-31E,Unit O	Database:	EDM 5000.1 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
700.00	0.39	127.30	700.00	-1.76	1.09	1.69	0.25	0.25	3.48
800.00	0.13	101.43	799.99	-1.99	1.47	1.90	0.28	-0.26	-25.87
900.00	0.40	117.95	899.99	-2.18	1.89	2.06	0.28	0.27	16.52
1,000.00	0.31	134.76	999.99	-2.53	2.39	2.38	0.14	-0.09	16.81
1,100.00	0.43	127.81	1,099.99	-2.95	2.88	2.77	0.13	0.12	-6.95
1,200.00	0.24	117.80	1,199.99	-3.28	3.36	3.06	0.20	-0.19	-10.01
1,300.00	0.82	96.40	1,299.98	-3.46	4.26	3.18	0.60	0.58	-21.40
1,400.00	0.43	87.76	1,399.98	-3.52	5.34	3.18	0.40	-0.39	-8.64
1,500.00	0.97	66.14	1,499.97	-3.17	6.49	2.75	0.59	0.54	-21.62
1,600.00	1.07	93.40	1,599.95	-2.88	8.20	2.35	0.49	0.10	27.26
1,700.00	1.23	87.48	1,699.93	-2.89	10.20	2.24	0.20	0.16	-5.92
1,800.00	1.16	78.70	1,799.91	-2.64	12.27	1.86	0.20	-0.07	-8.78
1,900.00	1.60	59.33	1,899.88	-1.73	14.46	0.81	0.64	0.44	-19.37
2,000.00	1.53	72.87	1,999.85	-0.63	16.94	-0.45	0.38	-0.07	13.54
Tie-In to VES Gyro									
2,091.00	1.80	87.30	2,090.81	-0.20	19.52	-1.04	0.55	0.30	15.86
First TDS MWD Survey									
2,154.00	1.10	39.80	2,153.79	0.31	20.90	-1.64	2.11	-1.11	-75.40
2,248.00	2.00	345.40	2,247.76	2.59	21.06	-3.92	1.73	0.96	-57.87
2,341.00	3.90	311.60	2,340.64	6.26	18.29	-7.41	2.69	2.04	-36.34
2,435.00	5.50	310.60	2,434.32	11.31	12.48	-12.08	1.70	1.70	-1.06
2,528.00	7.00	309.70	2,526.76	17.84	4.73	-18.10	1.62	1.61	-0.97
2,622.00	8.10	303.70	2,619.95	25.17	-5.18	-24.79	1.44	1.17	-6.38
2,716.00	7.60	304.60	2,713.07	32.37	-15.81	-31.30	0.55	-0.53	0.96
2,810.00	8.30	306.20	2,806.16	39.91	-26.40	-38.15	0.78	0.74	1.70
2,903.00	7.50	304.80	2,898.28	47.34	-36.80	-44.91	0.88	-0.86	-1.51
2,996.00	8.60	300.10	2,990.36	54.29	-47.80	-51.15	1.38	1.18	-5.05
3,090.00	8.20	302.10	3,083.35	61.38	-59.56	-57.47	0.53	-0.43	2.13
3,183.00	8.30	292.90	3,175.40	67.51	-71.36	-62.85	1.42	0.11	-9.89
3,277.00	9.40	297.30	3,268.28	73.67	-84.44	-68.17	1.37	1.17	4.68
3,370.00	8.90	299.80	3,360.09	80.73	-97.43	-74.39	0.69	-0.54	2.69
3,464.00	8.70	299.80	3,452.99	87.88	-109.91	-80.73	0.21	-0.21	0.00
3,557.00	8.70	299.90	3,544.92	94.88	-122.11	-86.94	0.02	0.00	0.11
3,652.00	8.80	300.50	3,638.81	102.15	-134.60	-93.40	0.14	0.11	0.63
3,745.00	9.50	300.80	3,730.63	109.69	-147.32	-100.12	0.75	0.75	0.32
3,838.00	9.60	302.00	3,822.34	117.73	-160.49	-107.30	0.24	0.11	1.29
3,932.00	9.50	301.00	3,915.04	125.88	-173.78	-114.59	0.21	-0.11	-1.06
4,024.00	9.60	301.10	4,005.76	133.75	-186.86	-121.62	0.11	0.11	0.11
4,118.00	9.40	306.90	4,098.47	142.41	-199.71	-129.44	1.04	-0.21	6.17
4,212.00	9.50	308.30	4,191.20	151.83	-211.94	-138.07	0.27	0.11	1.49
4,306.00	9.70	309.70	4,283.88	161.69	-224.12	-147.14	0.33	0.21	1.49
4,399.00	9.50	301.60	4,375.58	170.72	-236.68	-155.35	1.47	-0.22	-8.71



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Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
4,492.00	8.30	295.40	4,467.46	177.62	-249.28	-161.44	1.65	-1.29	-6.67	
4,585.00	7.90	297.30	4,559.54	183.43	-261.03	-166.49	0.52	-0.43	2.04	
4,679.00	8.60	302.70	4,652.56	190.19	-272.68	-172.50	1.11	0.74	5.74	
4,772.00	8.60	303.20	4,744.52	197.76	-284.35	-179.30	0.08	0.00	0.54	
4,866.00	8.70	304.90	4,837.45	205.67	-296.06	-186.46	0.29	0.11	1.81	
4,960.00	7.20	303.60	4,930.54	213.00	-306.80	-193.09	1.61	-1.60	-1.38	
5,053.00	5.60	303.70	5,022.96	218.74	-315.43	-198.28	1.72	-1.72	0.11	
5,146.00	3.90	302.60	5,115.64	222.96	-321.87	-202.08	1.83	-1.83	-1.18	
5,240.00	1.50	306.40	5,209.53	225.42	-325.56	-204.29	2.56	-2.55	4.04	
5,333.00	0.70	243.40	5,302.51	225.89	-327.04	-204.67	1.44	-0.86	-67.74	
5,395.00	0.90	229.30	5,364.51	225.40	-327.75	-204.14	0.45	0.32	-22.74	
5,426.00	1.90	186.10	5,395.50	224.73	-327.99	-203.45	4.48	3.23	-139.35	
5,457.00	4.60	176.50	5,426.44	222.98	-327.97	-201.70	8.85	8.71	-30.97	
5,488.00	7.90	177.50	5,457.26	219.61	-327.80	-198.35	10.65	10.65	3.23	
5,519.00	11.30	179.10	5,487.82	214.44	-327.66	-193.20	11.00	10.97	5.16	
5,550.00	14.40	181.40	5,518.04	207.55	-327.71	-186.32	10.13	10.00	7.42	
5,581.00	17.30	182.00	5,547.86	199.09	-327.96	-177.86	9.37	9.35	1.94	
5,613.00	20.80	181.40	5,578.10	188.65	-328.27	-167.43	10.95	10.94	-1.88	
5,644.00	24.20	180.60	5,606.74	176.79	-328.47	-155.58	11.01	10.97	-2.58	
5,675.00	27.60	178.80	5,634.62	163.25	-328.38	-142.07	11.26	10.97	-5.81	
5,706.00	30.50	178.00	5,661.71	148.21	-327.96	-127.09	9.44	9.35	-2.58	
5,737.00	33.60	177.30	5,687.99	131.77	-327.28	-110.73	10.07	10.00	-2.26	
5,768.00	37.00	177.20	5,713.28	113.88	-326.42	-92.93	10.97	10.97	-0.32	
5,799.00	40.70	177.40	5,737.42	94.46	-325.51	-73.60	11.94	11.94	0.65	
5,830.00	43.60	178.00	5,760.40	73.68	-324.67	-52.92	9.44	9.35	1.94	
5,861.00	44.70	178.30	5,782.65	52.10	-323.98	-31.42	3.61	3.55	0.97	
5,892.00	45.40	178.20	5,804.55	30.17	-323.31	-9.58	2.27	2.26	-0.32	
5,923.00	46.10	178.20	5,826.18	7.97	-322.61	12.53	2.26	2.26	0.00	
5,955.00	46.40	178.50	5,848.31	-15.13	-321.94	35.54	1.16	0.94	0.94	
5,986.00	47.00	178.20	5,869.57	-37.69	-321.29	58.01	2.06	1.94	-0.97	
6,017.00	47.60	178.10	5,890.59	-60.46	-320.56	80.69	1.95	1.94	-0.32	
6,045.95	49.56	178.29	5,909.74	-82.15	-319.87	102.30	6.79	6.77	0.65	
As-Drilled PP										
6,048.00	49.70	178.30	5,911.07	-83.71	-319.83	103.85	6.79	6.77	0.63	
6,080.00	52.20	178.10	5,931.23	-108.55	-319.05	128.59	7.83	7.81	-0.63	
6,111.00	53.40	178.20	5,949.97	-133.23	-318.25	153.17	3.88	3.87	0.32	
6,143.00	56.60	177.10	5,968.32	-159.42	-317.17	179.23	10.39	10.00	-3.44	
6,174.00	60.90	177.30	5,984.40	-185.88	-315.88	205.56	13.88	13.87	0.65	
6,204.00	64.50	179.30	5,998.16	-212.52	-315.09	232.10	13.38	12.00	6.67	
6,235.00	67.60	181.00	6,010.74	-240.85	-315.17	260.37	11.19	10.00	5.48	
6,266.00	71.30	181.70	6,021.62	-269.86	-315.86	289.37	12.12	11.94	2.26	
6,297.00	75.50	181.50	6,030.48	-299.55	-316.69	319.05	13.56	13.55	-0.65	



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6,328.00	79.30	181.20	6,037.24	-329.79	-317.40	349.28	12.29	12.26	-0.97	
6,359.00	83.10	181.20	6,041.98	-360.41	-318.04	379.88	12.26	12.26	0.00	
6,390.00	85.80	181.30	6,044.98	-391.26	-318.71	410.70	8.72	8.71	0.32	
6,427.00	89.10	179.90	6,046.62	-428.21	-319.10	447.61	9.69	8.92	-3.78	
6,459.00	90.20	179.40	6,046.82	-460.21	-318.91	479.53	3.78	3.44	-1.56	
6,490.00	90.00	179.10	6,046.76	-491.21	-318.50	510.44	1.16	-0.65	-0.97	
6,582.00	89.60	179.30	6,047.09	-583.20	-317.22	602.16	0.49	-0.43	0.22	
6,675.00	90.80	179.90	6,046.76	-676.19	-316.57	694.93	1.44	1.29	0.65	
6,768.00	90.70	180.30	6,045.54	-769.19	-316.73	787.74	0.44	-0.11	0.43	
6,862.00	90.30	180.40	6,044.72	-863.18	-317.30	881.58	0.44	-0.43	0.11	
6,956.00	89.90	181.10	6,044.56	-957.17	-318.53	975.46	0.86	-0.43	0.74	
7,050.00	91.30	181.20	6,043.57	-1,051.15	-320.42	1,069.37	1.49	1.49	0.11	
7,143.00	91.50	180.10	6,041.30	-1,144.11	-321.47	1,162.21	1.20	0.22	-1.18	
7,236.00	91.60	180.80	6,038.79	-1,237.07	-322.20	1,255.03	0.76	0.11	0.75	
7,329.00	91.70	179.50	6,036.11	-1,330.03	-322.45	1,347.82	1.40	0.11	-1.40	
7,422.00	91.70	180.00	6,033.35	-1,422.99	-322.04	1,440.56	0.54	0.00	0.54	
7,516.00	91.70	179.00	6,030.56	-1,516.94	-321.22	1,534.28	1.06	0.00	-1.06	
7,610.00	91.50	179.50	6,027.94	-1,610.90	-319.99	1,627.96	0.57	-0.21	0.53	
7,702.00	91.20	180.50	6,025.77	-1,702.87	-319.99	1,719.75	1.13	-0.33	1.09	
7,795.00	91.30	180.30	6,023.74	-1,795.85	-320.64	1,812.58	0.24	0.11	-0.22	
7,889.00	91.30	180.30	6,021.61	-1,889.82	-321.13	1,906.40	0.00	0.00	0.00	
7,982.00	91.70	179.60	6,019.17	-1,982.79	-321.05	1,999.17	0.87	0.43	-0.75	
8,076.00	92.60	178.90	6,015.65	-2,076.71	-319.82	2,092.83	1.21	0.96	-0.74	
8,169.00	92.40	178.70	6,011.59	-2,169.60	-317.88	2,185.41	0.30	-0.22	-0.22	
8,262.00	92.30	179.70	6,007.78	-2,262.52	-316.58	2,278.05	1.08	-0.11	1.08	
8,355.00	91.60	181.00	6,004.61	-2,355.46	-317.15	2,370.84	1.59	-0.75	1.40	
8,448.00	90.30	180.40	6,003.07	-2,448.44	-318.28	2,463.70	1.54	-1.40	-0.65	
8,509.00	90.00	180.40	6,002.91	-2,509.43	-318.71	2,524.61	0.49	-0.49	0.00	
8,572.00	89.60	179.50	6,003.13	-2,572.43	-318.65	2,587.47	1.56	-0.63	-1.43	
8,667.00	89.10	179.20	6,004.21	-2,667.42	-317.58	2,682.20	0.61	-0.53	-0.32	
8,760.00	89.70	179.50	6,005.18	-2,760.41	-316.52	2,774.93	0.72	0.65	0.32	
8,853.00	89.50	178.90	6,005.83	-2,853.40	-315.22	2,867.65	0.68	-0.22	-0.65	
8,946.00	89.90	179.50	6,006.32	-2,946.39	-313.92	2,960.37	0.78	0.43	0.65	
9,040.00	90.30	179.20	6,006.15	-3,040.38	-312.86	3,054.11	0.53	0.43	-0.32	
9,133.00	90.70	179.80	6,005.34	-3,133.37	-312.05	3,146.86	0.78	0.43	0.65	
9,226.00	90.10	178.50	6,004.69	-3,226.36	-310.67	3,239.57	1.54	-0.65	-1.40	
9,320.00	90.10	178.90	6,004.53	-3,320.33	-308.53	3,333.22	0.43	0.00	0.43	
9,413.00	90.00	178.70	6,004.45	-3,413.31	-306.59	3,425.89	0.24	-0.11	-0.22	
9,506.00	91.00	178.90	6,003.64	-3,506.29	-304.64	3,518.55	1.10	1.08	0.22	
9,599.00	90.50	179.70	6,002.42	-3,599.27	-303.50	3,611.28	1.01	-0.54	0.86	
9,693.00	92.20	179.90	6,000.20	-3,693.24	-303.18	3,705.04	1.82	1.81	0.21	
9,786.00	92.00	180.30	5,996.80	-3,786.18	-303.34	3,797.80	0.48	-0.22	0.43	



TDS
Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Puckett 13 Fed Com 25H
Project:	Eddy County, NM (NAD-83 2015)	TVD Reference:	KB @ 3978.00usft (Silver Oak 3)
Site:	Puckett 13 Fed Com 25H	MD Reference:	KB @ 3978.00usft (Silver Oak 3)
Well:	SHL: 250' FNL, 1,965' FEL, Sec 13,T-17S,R-31E,Unit B	North Reference:	Grid
Wellbore:	BHL: 350' FSL, 2,290' FEL, Sec 13,T-17S,R-31E,Unit O	Survey Calculation Method:	Minimum Curvature
Design:	BHL: 350' FSL, 2,290' FEL, Sec 13,T-17S,R-31E,Unit O	Database:	EDM 5000.1 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Buird Rate (°/100usft)	Turn Rate (°/100usft)
9,879.00	91.90	179.50	5,993.63	-3,879.12	-303.18	3,890.54	0.87	-0.11	-0.86
9,972.00	91.60	179.80	5,990.79	-3,972.08	-302.61	3,983.28	0.46	-0.32	0.32
10,066.00	91.40	180.40	5,988.33	-4,066.04	-302.77	4,077.06	0.67	-0.21	0.64
10,160.00	91.60	181.50	5,985.87	-4,160.00	-304.33	4,170.93	1.19	0.21	1.17
10,253.00	90.80	179.50	5,983.92	-4,252.97	-305.14	4,263.76	2.32	-0.86	-2.15
10,346.00	90.40	179.00	5,982.95	-4,345.95	-303.92	4,356.48	0.69	-0.43	-0.54
10,439.00	90.20	179.10	5,982.46	-4,438.94	-302.38	4,449.18	0.24	-0.22	0.11
10,532.00	90.30	179.60	5,982.06	-4,531.93	-301.33	4,541.92	0.55	0.11	0.54
10,617.00	90.00	179.70	5,981.83	-4,616.93	-300.81	4,626.71	0.37	-0.35	0.12
Last TDS MWD Survey									
10,674.00	90.00	179.70	5,981.83	-4,673.93	-300.51	4,683.58	0.00	0.00	0.00
Projection to Bit/TD									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	+E/-W (usft)	Comment
6,045.95	5,909.74	-82.15	-319.87	As-Drilled PP
10,617.00	5,981.83	-4,616.93	-300.81	Last TDS MWD Survey
10,674.00	5,981.83	-4,673.93	-300.51	Projection to Bit/TD

Checked By:

Deborah L. Mason

Approved By:

James H. Mason

Date: 11/2/2016



DEBORAH L. MASON
My Commission Expires
February 20, 2019



11/2/16

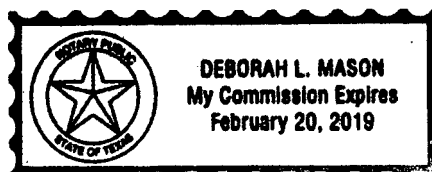
State of New Mexico
County of Eddy

I, Donald D. Mason, certify that: I am employed by Terra Directional Services LLC; that I did on the day(s) of 08/18/2016 through 08/25/2016 conduct or supervise the taking of a MWD survey from a depth of 2091 feet to a depth of 10674 feet; that the data is true, correct, complete and within the limitations of the tool as set forth by Terra Directional Services LLC; that I am authorized and qualified to make this report; that this survey was conducted at the request of COG Operating LLC for the Puckett 13 Fed Com #25H Well API 30-015-43785 in Eddy County, New Mexico; and that I have reviewed this report and find that it conforms to the principles and procedures as set forth by Terra Directional Services LLC.

Donald D. Mason
President

State of Texas
County of Burnet

Before me, a notary public, on this day personally appeared Donald D Mason, known to me to be the person whose name is subscribed to the foregoing document and, being by me first duly sworn, declared that the statements therein contained are true and correct.



Notary Public's Signature



August 22, 2016

Concho Resources, Inc.
One Concho Center
600 W. Illinois Avenue
Midland, Texas 79701

NM OIL CONSERVATION
ARTESIA DISTRICT

NOV 14 2016

Attn: Kanicia Castillo

RECEIVED

RE: Puckett 13 Federal Com No. 25H

Please find enclosed a copy of the survey from 0' to 2000' ran on the above referenced well.

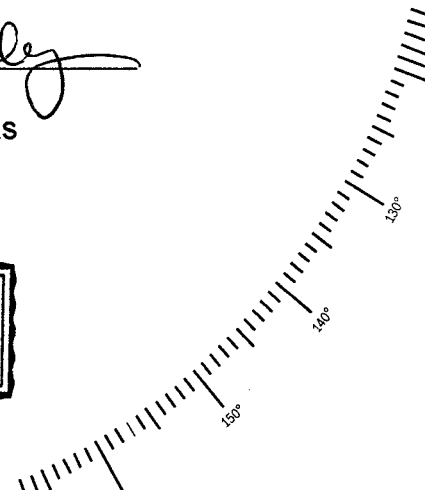
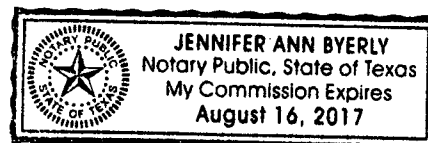
Sincerely,


Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 22nd day of August,
A.D., 2016, by Keith Havelka.

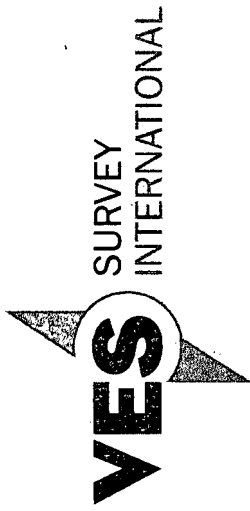

Jennifer Ann Byerly
Notary Public, State of Texas





Company: COG Operating
Lease/Well: Puckett 13 Federal Com No./25H

Rig Name: Silver Oak 3
State/County: New Mexico/Eddy
VS-Azi: 0.00 Degrees
Latitude: 32.81425, Longitude: -103.82090
Grid North = True North -0.28 degs (NAD 27)
Grid Correction Applied = -0.28 degs



Depth Reference : RKB = 18 Foot

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyro survey-de_01.ut
Minimum Curvature Method
Report Date/Time: 8/22/2016 / 12:56

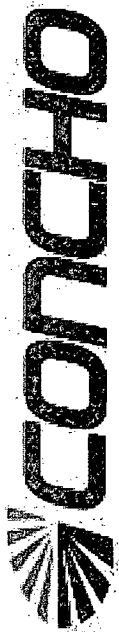
VES Survey International
Midland Tx
(432) 563-5444

Surveyor: Gene Heiss

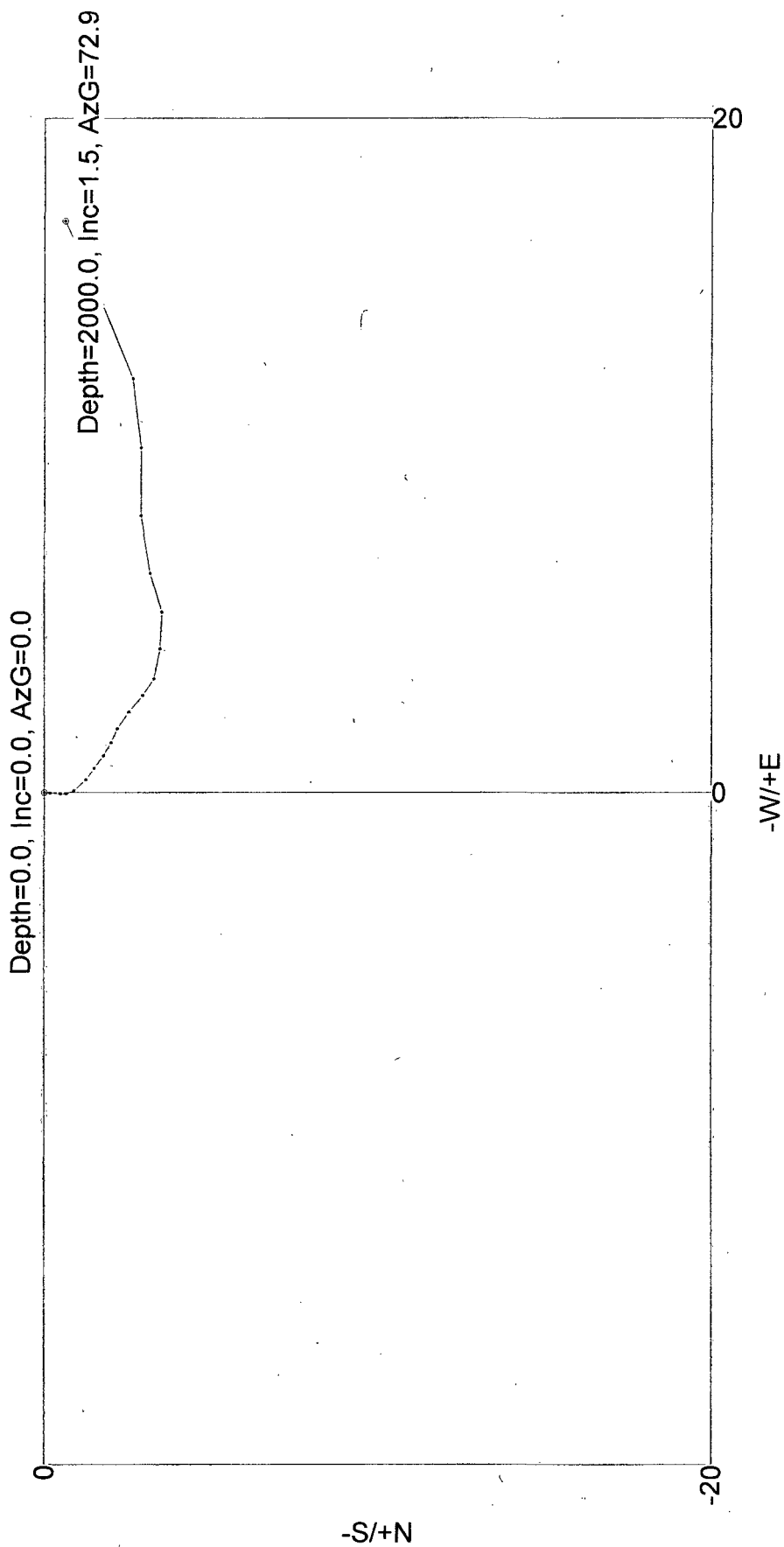
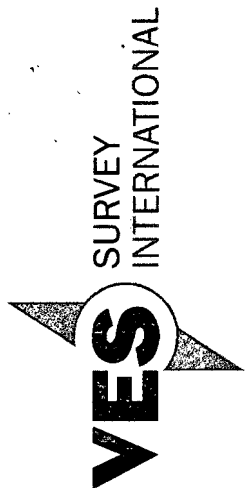
Puckett 13 Federal Com No. 25H / API 30-015-43785

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.20	185.49	100.00	-0.17	-0.02	-0.17	0.17	185.49	0.20
200.00	0.16	184.74	200.00	-0.48	-0.04	-0.48	0.48	185.27	0.04
300.00	0.04	163.02	300.00	-0.65	-0.04	-0.65	0.66	183.87	0.12
400.00	0.24	156.52	400.00	-0.88	0.05	-0.88	0.88	176.75	0.19
500.00	0.34	125.65	500.00	-1.25	0.37	-1.25	1.30	163.29	0.18
600.00	0.14	123.82	600.00	-1.49	0.72	-1.49	1.65	154.26	0.20
700.00	0.39	127.30	700.00	-1.76	1.09	-1.76	2.08	148.24	0.25
800.00	0.13	101.43	799.99	-1.99	1.47	-1.99	2.48	143.56	0.28
900.00	0.40	117.95	899.99	-2.18	1.89	-2.18	2.88	139.11	0.28
1000.00	0.31	134.76	999.99	-2.53	2.38	-2.53	3.47	136.72	0.14
1100.00	0.43	127.81	1099.99	-2.95	2.87	-2.95	4.11	135.77	0.14
1200.00	0.24	117.80	1199.99	-3.28	3.36	-3.28	4.69	134.34	0.20
1300.00	0.82	96.40	1299.98	-3.46	4.26	-3.46	5.48	129.09	0.60
1400.00	0.43	87.76	1399.98	-3.52	5.34	-3.52	6.40	123.41	0.41
1500.00	0.97	66.14	1499.97	-3.17	6.49	-3.17	7.22	116.01	0.60
1600.00	1.07	93.40	1599.95	-2.88	8.20	-2.88	8.69	109.34	0.49

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1700.00	1.23	87.48	1699.93	-2.89	10.20	-2.89	10.60	105.79	0.19
1800.00	1.16	78.70	1799.91	-2.64	12.27	-2.64	12.55	102.14	0.19
1900.00	1.60	59.33	1899.88	-1.73	14.46	-1.73	14.57	96.82	0.63
2000.00	1.53	72.87	1999.85	-0.63	16.93	-0.63	16.95	92.13	0.37



VES Survey International
Midland Tx
(432) 563-5444
Surveyor: Gene Heiss
Puckett 13 Federal Com No. 25H / API 30-015-43785





I Gene Heiss certify that I am employed by VES Survey International. That I did on the day(s) of 08/17/16 through 08/17/16 conduct or supervise the taking of a Rate Gyro survey from a depth of 0.00 feet to a depth of 2,000.00 feet; that the data is true, correct, complete and within the limitations of the tool as set forth by Vaughn Energy Services, that I am authorized and qualified to make this report; that this survey was conducted at the request of Concho for the Puckett 13 Federal Com Well # 25H API # 30-015-43785 in Eddy County / Parish New Mexico; and that I have reviewed this report and find that it conforms to the principles and procedures as set forth by VES Survey International.

A handwritten signature in black ink, appearing to read "Gene Heiss", is written over a horizontal line.

Gene Heiss
Service Technician
VES Survey International



PO Box 1370
Artesia, NM 88211-1370
(575) 748-1288

NM OIL CONSERVATION
ARTESIA DISTRICT

NOV 14 2016

RECEIVED

August 29, 2016

COG, LLC
One Concho Center
600 W. Illinois Ave.
Midland, TX 79701

RE: Puckett 13 Fed Com 25H
250' FNL & 1965' FEL
Sec. 13, T17S, R31E
Eddy County, New Mexico

Dear Sir,

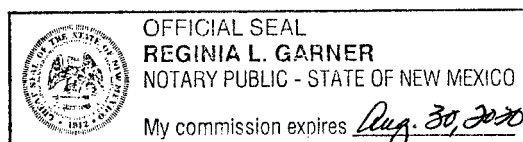
The attached is the Deviation Survey for the above captioned well.

Very truly yours,

Chris Graham
Drilling Superintendent

State of New Mexico }
County of Eddy }

The foregoing was acknowledged before me this 29th day of August, 2016.

Notary Public

Puckett 13 Fed Com 25H

Date	Depth	Deviation	Direction
8/15/2016	206	0.10	
8/15/2016	539	0.30	
8/15/2016	723	0.50	
8/16/2016	791	0.30	
8/16/2016	1009	0.50	
8/17/2016	1507	0.60	
8/18/2016	2091	1.80	87.30
8/18/2016	2154	1.10	39.80
8/18/2016	2248	2.00	345.40
8/18/2016	2341	3.90	211.60
8/18/2016	2435	5.50	310.60
8/18/2016	2528	7.00	309.70
8/18/2016	2716	7.60	304.60
8/18/2016	2903	7.50	304.80
8/18/2016	2996	8.60	300.10
8/18/2016	3090	8.20	302.10
8/19/2016	3193	8.30	292.90
8/19/2016	3277	9.40	297.30
8/19/2016	3370	8.90	299.80
8/19/2016	3464	8.70	299.80
8/19/2016	3557	8.70	299.90
8/19/2016	3652	8.80	300.50
8/19/2016	3838	9.60	301.00
8/19/2016	3932	9.50	301.00
8/19/2016	4027	9.60	301.00
8/19/2016	4118	9.40	306.90
8/19/2016	4212	9.50	308.30
8/19/2016	4306	9.70	309.70
8/19/2016	4399	9.50	301.60
8/19/2016	4492	8.30	295.40
8/19/2016	4585	7.90	297.30
8/19/2016	4772	8.60	303.20
8/19/2016	4866	8.70	304.90
8/19/2016	4960	7.20	303.60
8/19/2016	5053	5.60	303.70
8/19/2016	5146	3.90	302.60
8/20/2016	5333	0.70	243.40
8/20/2016	5395	0.90	229.30
8/20/2016	5457	4.60	176.50
8/20/2016	5519	11.30	179.10
8/20/2016	5550	14.40	181.40
8/20/2016	5581	17.30	182.00

Date	Depth	Deviation	Direction
8/20/2016	5675	27.60	178.80
8/20/2016	5737	33.60	177.30
8/20/2016	5799	40.70	177.40
8/20/2016	5861	44.70	178.30
8/20/2016	5923	46.10	178.20
8/21/2016	6048	49.70	178.30
8/21/2016	6080	52.20	178.10
8/21/2016	6111	53.40	178.20
8/21/2016	6143	56.60	1721.00
8/21/2016	6204	60.90	177.30
8/21/2016	6235	67.60	181.00
8/21/2016	6266	71.30	181.70
8/21/2016	6297	75.50	181.50
8/21/2016	6328	79.30	181.20
8/21/2016	6359	83.10	181.20
8/21/2016	6390	85.80	181.30
8/22/2016	6427	89.10	179.90
8/22/2016	6459	90.20	179.40
8/22/2016	6490	90.00	179.10
8/22/2016	6582	89.60	179.30
8/22/2016	6675	90.80	179.90
8/22/2016	6768	70.70	180.30
8/22/2016	6862	90.30	180.40
8/22/2016	6956	89.90	181.10
8/22/2016	7050	91.70	181.20
8/22/2016	7103	91.50	180.10
8/22/2016	7276	91.60	180.80
8/22/2016	7329	91.70	179.50
8/22/2016	7422	91.70	180.00
8/22/2016	7516	91.70	179.00
8/22/2016	7610	91.50	179.50
8/22/2016	7702	91.20	180.50
8/22/2016	7795	91.30	180.30
8/22/2016	7889	91.30	180.30
8/22/2016	7982	91.70	179.60
8/23/2016	8076	92.60	178.90
8/23/2016	8169	92.40	178.70
8/23/2016	8262	92.30	179.70
8/23/2016	8355	91.60	181.00
8/23/2016	8448	90.30	180.40
8/23/2016	8572	89.60	179.50
8/23/2016	8667	89.10	179.20
8/23/2016	8760	89.70	179.50
8/24/2016	8853	89.50	178.90
8/24/2016	8946	89.90	179.50

Date	Depth	Deviation	Direction
8/24/2016	9000	90.30	179.20
8/24/2016	9133	90.70	179.80
8/24/2016	9226	90.10	178.50
8/24/2016	9320	90.10	178.90
8/25/2016	9413	90.00	178.70
8/25/2016	9506	91.00	178.90
8/25/2016	9599	90.50	179.70
8/25/2016	9693	92.20	179.90
8/25/2016	9879	91.90	179.50
8/25/2016	9972	91.60	179.80
8/25/2016	10066	91.40	180.40
8/25/2016	10160	91.60	181.50
8/25/2016	10253	90.80	179.50
8/25/2016	10346	90.40	179.00
8/25/2016	10439	90.20	179.10
8/25/2016	10532	90.30	179.60